

REMARKS

The above amendment to Claim 1 serves to narrow the scope of the invention by substituting the term "consisting essentially of" for "comprising" and to narrow the scope of the mixture in (A) by inserting the phrase "consisting essentially". Claims 2 and 3 have been canceled. No new matter has been added by this amendment.

Applicants' invention relates to a process for the production of a cellular composite. This process consists essentially of: (A) preparing a mixture consisting essentially of (1) a polyisocyanate and (2) water, (B) adding the mixture formed in (A) to (3) hollow inorganic microspheres under low shear mixing, (C) completely filling a mold with the mixture formed in (B), and (D) heating the filled mold at a temperature of from 100 to 280°C. This reacts the polyisocyanate and water to form a polyurea which binds the hollow microspheres, and forms a cellular composite. These cellular composites have a high compressive strength and a low density at typical (i.e. conventional) binder concentrations (see page 1, lines 27-31 of the present application).

Rejection under 35 U.S.C. 103(a)

Claims 1-9 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Cioca et al reference (U.S. Patent 4,380,474) in view of the Markusch et al reference (U.S. Patent 3,965,051).

Polyisocyanate reaction products are disclosed by the Cioca et al reference. These are specifically reaction products of polyisocyanates and tanned leather scrap. The resultant products of these reaction products have comparable integrity, workability and economic advantage as, for example, chip board or particle board. (See column 1, lines 59-63.) Tanned leather scrap as in the Cioca et al reference refers specifically to by-products of leather production, and includes the (chrome) shavings and trimmings of a tanned leather resulting from the manufacture of a leather product. (see column 2, lines 11-14.)

The Markusch et al reference discloses composite materials that comprise inorganic or organic particles or fibers, bonded together with an organic polyisocyanate which contains ionic groups (column 2, lines 50-55). Suitable polyisocyanates with ionic groups and processes of preparing these are disclosed at

column 4, line 1 through column 9, line 13. The resultant composite materials are suitable for filling cracks, joints, etc. They are also suitable for making panels and other products for the building industry.

Applicants respectfully submit that this combination of references does not suggest the presently claimed invention to one of ordinary skill in the art.

The process of the Cioca et al reference comprises reacting a polyisocyanate and chrome shavings. The chrome shavings are by-products of leather production resulting from the manufacture of leather goods (column 2, lines 11-14). Dimensions of this leather scrap vary and may range from powdery particulates to thin small flexible sheets which have a thickness of about 1 to 30 mils.

In addition, the chrome shavings typically contain a relatively large amount of water, i.e. up to 50% by weight. It is, however, preferable to dry the tanned leather scrap to the equilibrium state in which the water content is from 6 to 12% by wt (see column 2, lines 15-36). The chrome shavings are generated by treating a leather hide with a chrome containing chemical which prevents the hide from putrefying. Chrome shavings are known to be hydrophilic in nature, whereas the other leather scrap is hydrophobic due to the presence of fats, finishing chemicals, etc. (column 2, lines 42-46).

The Cioca et al reference also discloses that it is unclear whether the water of equilibrium in the tanned leather scrap reacts with the isocyanate, or if it is sufficiently bound within the structure such that they are unavailable for reaction with the isocyanate. (See column 2, lines 51-63.) The tanned leather scrap contains pendant functional groups along the polypeptide chains and it is these functional groups which the polyisocyanate reacts with to form the binder and provide structural integrity of the final product (column 2, line 47 through column 3, line 2). The process of the Cioca et al reference includes mixing the materials, placing them in a press and heating the temperature to cure the composite. Upon curing, the articles are suitable for construction and have comparable properties to particle board or chip board (column 4, lines 3-24).

Applicants respectfully submit that any construction of the Cioca et al reference requires the chrome shavings (i.e. scrap leather). This is evident from the fact that one purpose of this reference is to provide a use for leather scrap, including

the chrome shavings. (See column 1, lines 49-68.) Chrome shavings and other types of leather by-product are, however, clearly excluded from the present invention in view of the above amendments.

The Markusch et al reference discloses a broad list of materials suitable to be used as the particulate and/or fibrous component of the invention therein. This list of materials includes, for example, various inorganic or organic substances in the form of powder, granules, wire, fibers, crystallites, spirals, rods, solid beads, hollow beads, non-woven webs, woven and knitted fabrics, tapes, etc, of materials such as dolomite, chalk, clay, asbestos, basic silicic acids, sand, talcum, iron oxide, alkali metal silicates, zeolites, calcium silicates, calcium sulfates, cements, glass fibers, carbon fibers, graphite, carbon black, silicon powder, expanded clay particles, hollow glass beads, glass powder, lava, pumice, sawdust, wood meal, cork, coke, etc. (See column 9, line 19 through column 10, line 6.)

The Examiners' position is that "it would have been obvious for one having ordinary skill in the art to have interchangeably employed the inorganic beads of Markusch et al. in place of the wood flakes/dust of Cioca et al. as motivated by the reasonable expectation that they will behave comparably in order to arrive at the products and processes of applicants' claims with the expectation of success...". (See page 3, lines 3-8 of the final Office Action dated August 18, 2004.) In short, the Examiner states that it is obvious to substitute the inorganic beads from the Markusch et al reference for the sawdust and/or wood chips of the Cioca et al reference.

The Cioca et al reference discloses at column 3, lines 57-60 that sawdust, wood chips and the like may be added to the invention therein. It does not disclose or suggest that the substitution of wood chips, sawdust, etc. for the chrome shavings. Thus, the composite articles formed in such an embodiment of the Cioca et al reference would comprise a polyisocyanate as the binder for chrome shavings (from tanned leather), and wood chips or sawdust.

While the substitution of inorganic beads for sawdust and/or wood chips may in fact be suggested by the Markusch et al reference, it is respectfully submitted that the substitution of inorganic hollow beads for the sawdust and/or wood chips in the Cioca et al reference does **not** result in Applicants' claimed invention. Substituting

the inorganic hollow beads for sawdust and/or wood chips (as suggested by Markusch et al) in the Cioca reference, results in composite articles of a polyisocyanate, chrome shavings, and inorganic hollow beads. This is "obviously" not the presently claimed invention.

As previously stated, the Cioca et al reference expressly states that the sawdust, wood chips etc, may be **added** to the materials used to form the composites therein. Thus, sawdust, wood chips, etc are used **in addition to** the chrome shavings in forming articles of the invention therein (column 3, lines 57-60). It is **not** disclosed or suggested by the Cioca et al reference that wood chips and/or sawdust can be substituted for the chrome shavings therein. Applicants respectfully submit that it is, however, necessary for the Cioca et al reference to disclose and/or suggest such a substitution in order for this particular combination of references to suggest the presently claimed invention to one of ordinary skill in the art.

Neither the Cioca et al reference or the Markusch et al reference expressly disclose, suggest or provide any hint that sawdust and/or wood chips could be substituted for the chrome shavings of the Cioca et al reference. This is essential, however, for the Examiner to establish a proper case of prima facie obviousness of the presently claimed invention over the Cioca et al reference in view of the Markusch et al reference. The Cioca et al reference simply states that these (i.e. sawdust and/or wood chips) may be in addition to the chrome shavings. The Markusch et al reference discloses (at best) that inorganic hollow beads are "equivalent to" sawdust, wood chips, etc. Accordingly, the substitution suggested by this combination is, at best, to use inorganic hollow beads instead of the sawdust and/or wood chips but in combination with the chrome shavings. However, this does not eliminate the need and/or presence of the chrome shavings!

There is no clear basis to substitute the sawdust and/or wood chips for the chrome shavings in the Cioca et al reference. Therefore, even if the Markusch et al reference properly identifies inorganic hollow beads as equivalents to sawdust and/or wood chips, there is simply no basis to substitute the inorganic hollow beads of the Markusch et al reference for the chrome shavings of the Cioca et al reference.

Accordingly, it is respectfully submitted by Applicants that the presently claimed invention is not *prima facie* obvious in view of the Cioca et al reference combined with the Markusch et al reference.

It is readily apparent that the Cioca et al reference requires the chrome shavings and these are clearly excluded by the presently amended claim language. Applicants respectfully submit that their use of "consisting essentially of" with regard to the process steps and with regard to the mixture narrows the present invention such that the required chrome shavings of the Cioca et al reference are excluded from invention.

Furthermore, the chrome shavings as required by the Cioca et al reference would substantially change the product. As set forth in this reference at column 1, lines 49-68, the composite materials therein are inherently fire retardant; and at column 4, lines 25-30 the composite materials are inherently resistant to fungal bacterial decomposition and rotting, and since they are poisonous upon ingestion they act as an insecticide or rodenticide. It is readily apparent that in the absence of the chrome shavings, these characteristics are not present in the resultant composite. Accordingly, the cellular composites produced by the presently claimed process are clearly altered in several ways upon the addition of chrome shavings as required by the Cioca et al reference.

In view of the above amendments and remarks, Applicants respectfully submit that the presently claimed invention is not properly rejected under 35 U.S.C. 103(a) as being obvious over the Cloca et al reference combined with the Markusch et al reference. It is respectfully requested that this rejection be withdrawn and Claims 1 and 4-9 be allowed.

Respectfully submitted,

By



N. Denise Brown
Agent for Applicants
Reg. No. 36,097

Bayer MaterialScience LLC
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-3804
FACSIMILE PHONE NUMBER:
(412) 777-3902

jdg/brown/db011